Wind and Weather

Wind

- Wind has the greatest <u>VARIABLE</u> effect on ballistic trajectories
- Elements of wind effects
  - The time the projectile is exposed to the wind (DISTANCE to target)
  - Direction the wind is blowing
  - Velocity of the wind

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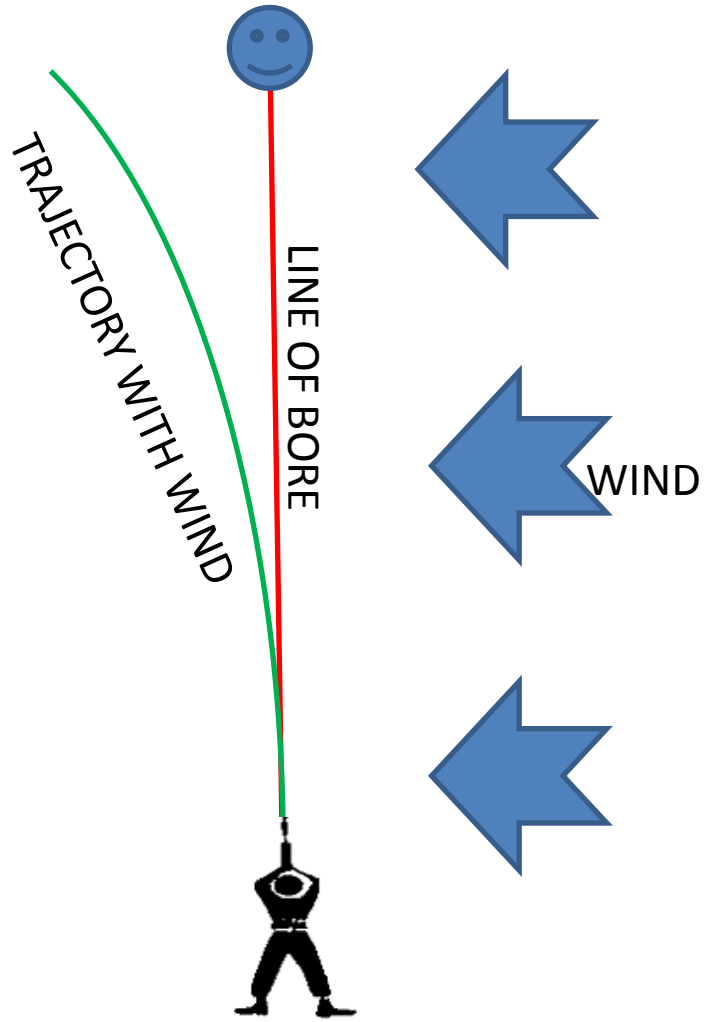
WIND EFFECTS



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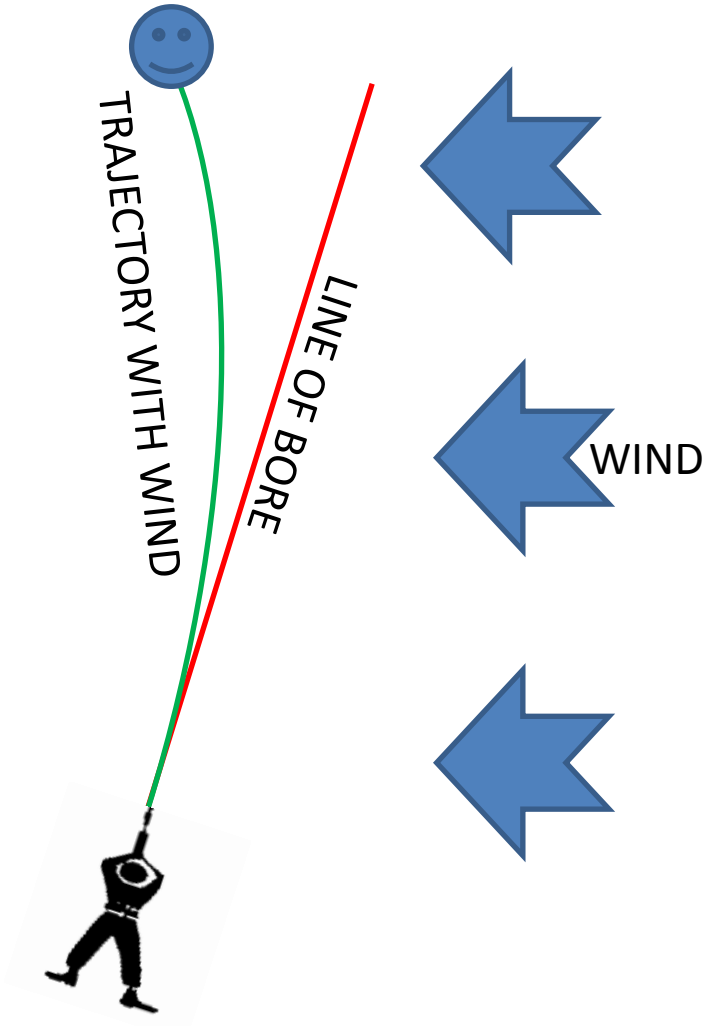
WIND EFFECTS



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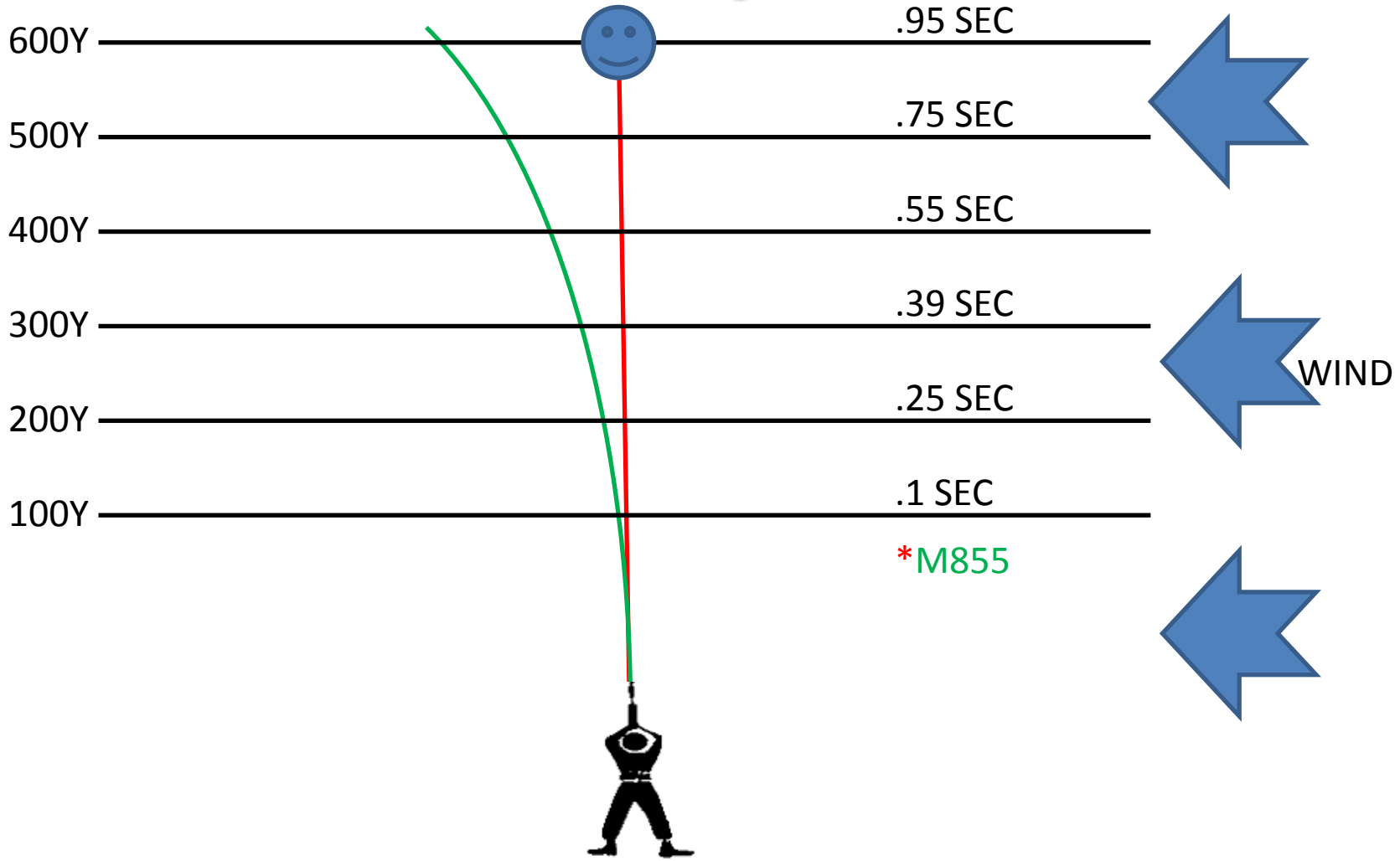
DISTANCE TO TARGET/TIME OF FLIGHT



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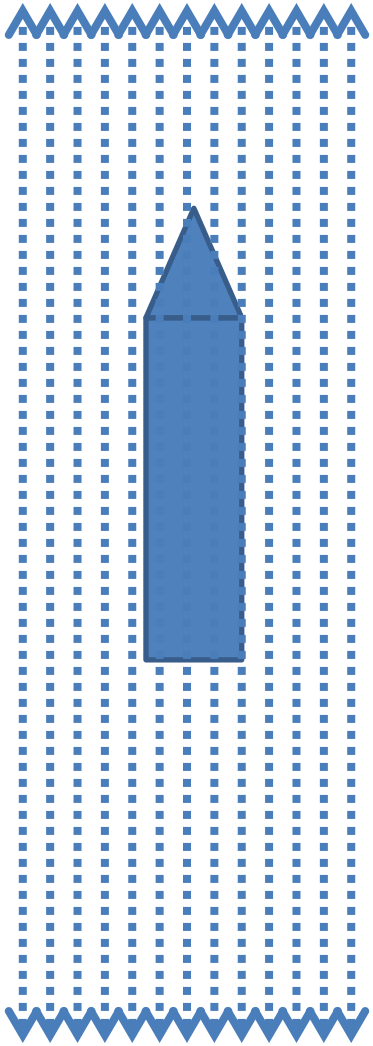
NO VALUE WIND



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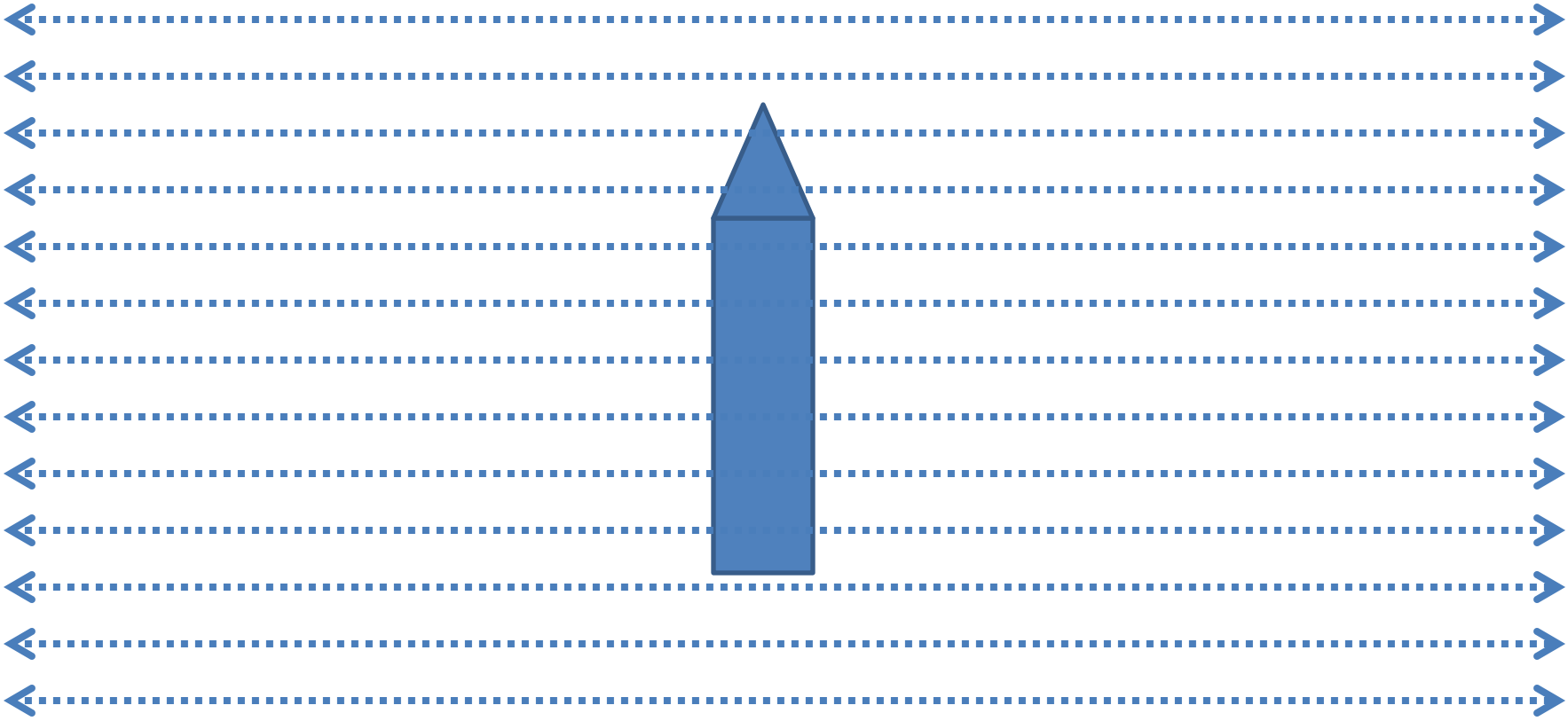
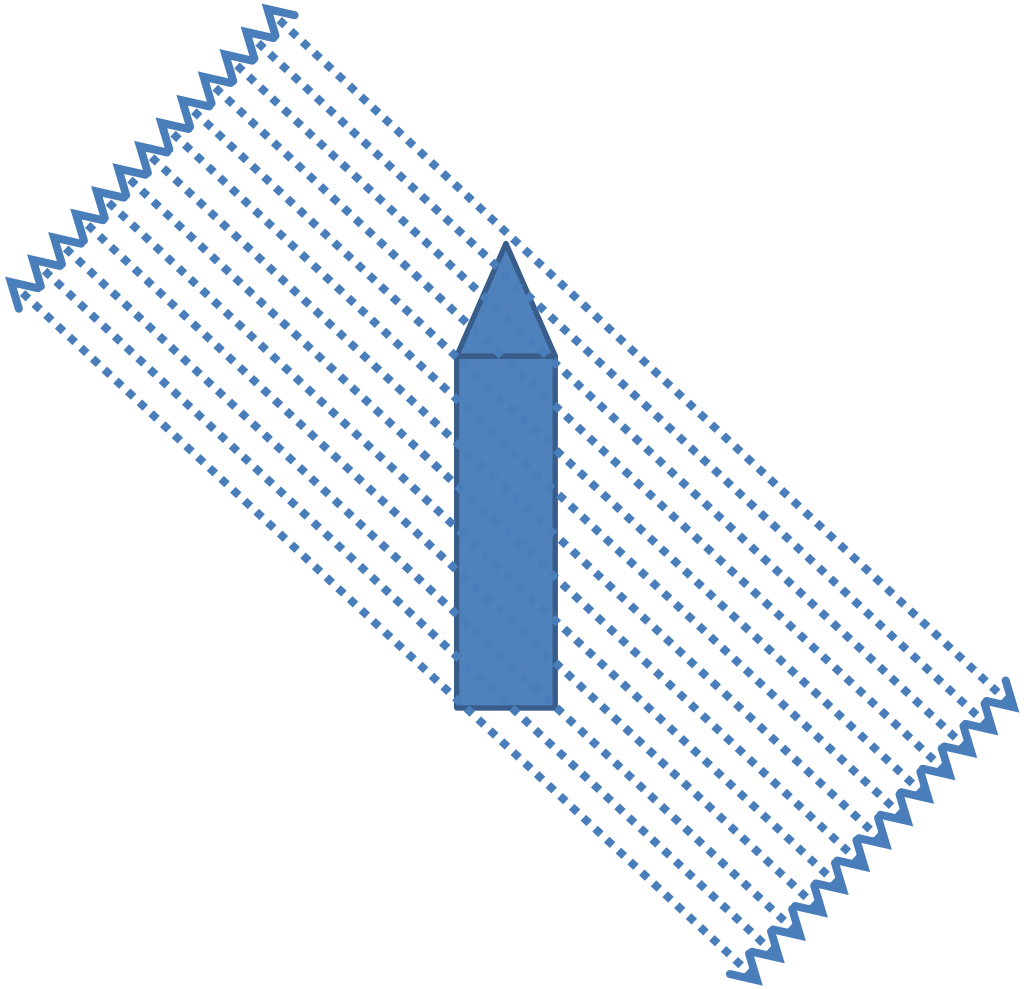
FULL VALUE WIND



HALF WIND VALUE



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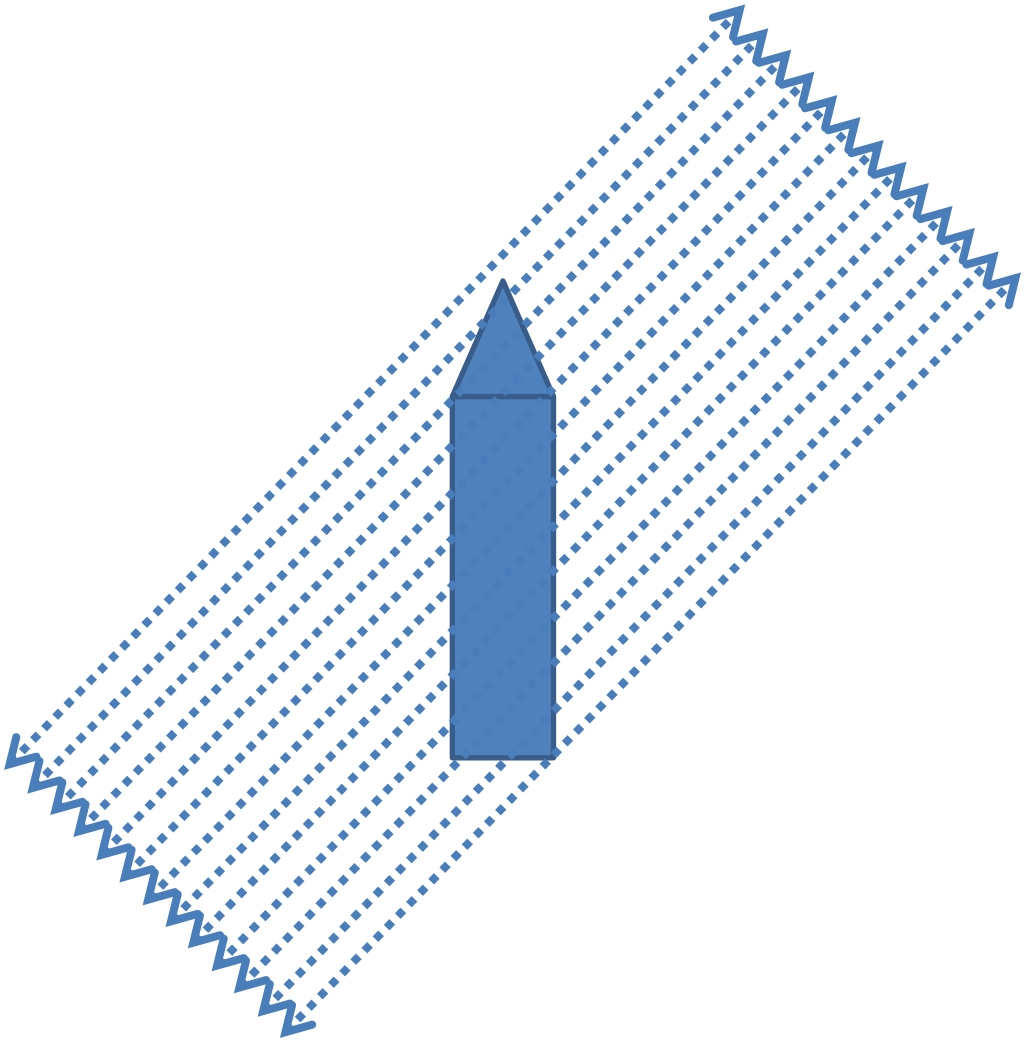
HALF WIND VALUE



WIND ESTIMATION

- Utilize wind indicators between shooter and target
- Things to determine
  - Velocity
  - Direction

WIND ESTIMATION

- Wind Indicators
  - Felt on skin
  - Foliage movement
  - Debris and dust movement
  - Mirage

WIND ESTIMATION QUANTIFIED

0-3 mph - Hardly felt, but smoke drifts

3-5 mph - Felt lightly on the face

5-8 mph - Keeps leaves in constant movement

8-12 mph - Raises dust and loose paper

12-15 mph - Causes small trees to sway

LEARNING TO READ WIND

- Use of Kestrel or other anemometer
- Study previous shots
- Watch trajectory through spotting scope

Wind Formula for 5.56mm

$$\frac{\text{Range(meters) X Velocity(MPH)}}{7} = \text{MOA of Drift}$$

Example

$$\frac{\text{4(00) meters X 7 mph}}{7} = \text{4 MOA or 16”}$$

Wind Formula Work Sheet

$$\frac{\text{Range(meters) X Velocity(MPH)}}{7} = \text{MOA of Drift}$$

1) 300m @ 10mph	4.28 (round to 4 MOA)
2) 500m @ 7mph	5 MOA
3) 600m @ 15mph	12.85 (round to 13 MOA)
4) 400m @ 20mph	11.42(round to 11 MOA)
5) 100m @ 14mph	2 MOA

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Wind Formula Work Sheet

For half value wind

$$\frac{\text{Range(meters) X Velocity(MPH)}}{7} = \text{MOA of Drift} \div 2$$

1) 300m @ 10mph	4.28 (round to 4 MOA) ÷ 2 = 2 MOA
2) 500m @ 7mph	5 MOA ÷ 2 = 2.5 MOA
3) 600m @ 15mph	12.85 (round to 13 MOA) ÷ 2 = 6.5 MOA
4) 400m @ 20mph	11.42(round to 11 MOA) ÷ 2 = 5.5 MOA
5) 100m @ 14mph	2 MOA ÷ 2 = 1 MOA

USING WIND EFFICIENTLY

1. ESTIMATE MAX AND MIN WIND VELOCITIES
2. ESTIMATE VALUE OF WIND
3. CALCULATE WIND HOLDS FOR MAX AND MIN
4. AS CONDITIONS VARY, ADJUST HOLD BY REFERENCING MAX AND MIN

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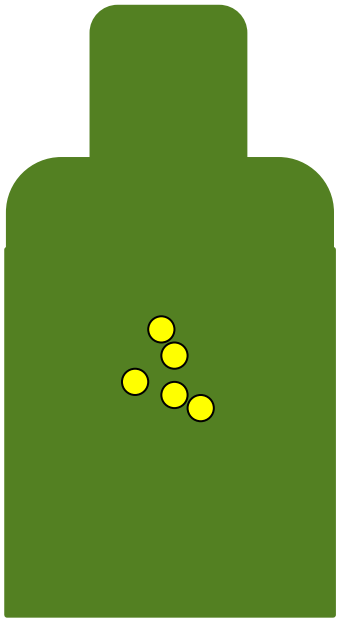
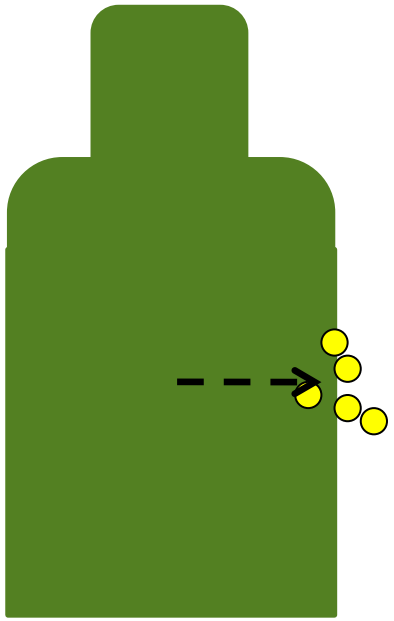
ZEROING IN WIND

Zeroing at 300 meters in windy conditions.



This applies to zeroing at distance. Not 25 meters.

Shooting the next day with the same zero but with NO wind blowing.



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WEATHER

TEMPERATURE

DISTANCE	30 DEG F	100 DEG F
200M	6.4	6.1
300M	0	0
400M	-17	-15.6
500M	-48.4	-43.7
600M	-99.6	-88.3

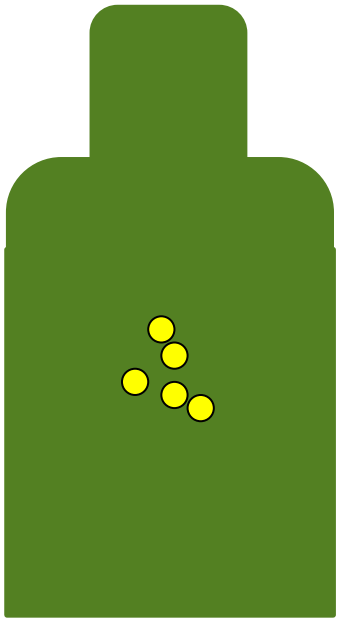
ALTITUDE/AIR DENSITY

DISTANCE	0’ ELEV	6000’ ELEV
200M	6.3	5.6
300M	0	0
400M	-16.4	-14.2
500M	-46.2	-39
600M	-94.3	-77.3

MASTER MARKSMANSHIP TRAINING COURSE

ZEROING IN WINDY CONDITIONS

Zeroing at 300 meters in windy conditions.



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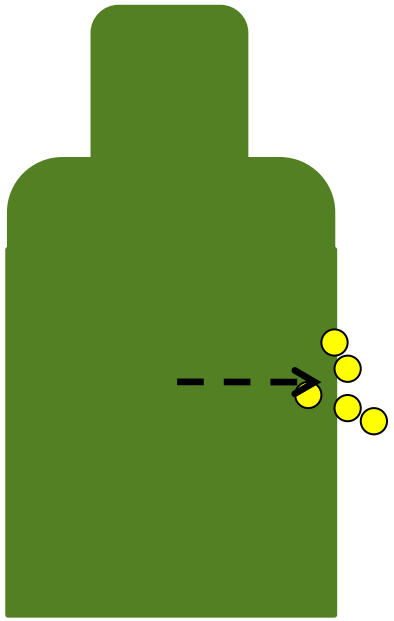

Questions?